PHILIPPINE COUNTRY REPORT OF THE NATIONAL INSTITUTE ACTIVITIES ON AGRICULTURAL MECHANIZATION

Agricultural Mechanization Development Program
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OUTLINE OF PRESENTATION

I. Introduction – AMDP Profile
II. R&D Group
III. Training, Extension and Information Group
IV. Special Projects
V. General Services and Other Accomplishments
RESEARCH AND DEVELOPMENT GROUP
Corn Mechanization Sub-program

Design, Development and Testing of Hand Tractor and Attachments for Corn Production

- Power tiller with steering mechanism
- Testing of the power tiller in farmer's field
Design, Development and Testing of Hand Tractor and Attachments for Corn Production... cont’d

• Completed AutoCAD design drawing
• Design of attachments (trailer, plow, harrow) suitable to the Cebu farm conditions was conceptualized.
• Fabricated the first prototype of the power tiller with steering mechanism
• Field testing in farmer’s field.

Design, Development and Testing of a Pneumatic Seed Planter cum Fertilizer Applicator

• Completed the fabrication of the planter with fertilizer applicator is completed.
• Completed test of an alternative blower.
• Completed cost evaluation of the project
Design, Development and Testing of a Power-Tiller Attached Manure Applicator

• Completed the fabrication of the second prototype.
• Completed testing of the second prototype.
• The prototype was redesigned to tap power from the power tiller to actuate the metering device.

Design, Development and Testing of a Power-Tiller Attached Manure Applicator
…cont’d

First prototype

Second prototype
Upland Irrigation System and Water Management

• Collected secondary data for the development of basic design criteria/parameters for rain harvesting
• Designed a rain harvesting module for a 0.25 hectare corn farm
• Identified a farmer-cooperator in Tongo, Cebu.

Design and Development of Corn Milling Systems

• Modification of the first prototype to improve durability and ease of fabrication.
  
• Incorporated a hulling unit as per requirement of intended clientele.
  
• An extruder was fabricated as part of the corn milling system for the production of noodles
  
• Demonstrated the performance of corn milling system in AMDP training programs.
Design and Development of Corn Milling Systems . . . Cont’d

The AMDP Corn Mill

Design and Development of Shelling System for Corn

- Fabrication of 1-unit corn sheller with built-in modifications was completed.
- Working drawings based on modifications were completed.
- Conducted survey for shelling and milling system for pilot areas.
- Prototype was subjected to suitability testing.
- The machine was demonstrated in a techno-demo activity.
- There was an enthusiastic response from most farmers since they had to go to a nearby town to shell and mill.
Design and Development of Shelling System for Corn. . . Cont’d

Techno-demo of the AMDP Corn Sheller

Design and Development of Multi-purpose Biomass Furnace with Heat Exchanger

– Produced technical drawings of 2nd design individual components.

– Areas with large-scale biomass fired furnace for drying purposes were visited.

– Completion of several components of the furnace. (heat exchanger, feeding system, fuel feeder, furnace base, bearing housing, ducting, flatbed dryer, stand, chimney, hood).
Design and Development of Multi-purpose Biomass Furnace with Heat Exchanger . . . Cont’d

Biomass Furnace  Fuel feeding mechanism
Fuel inlet hopper  Chimney

High Value Crops Mechanization Sub-program
Design, Construction and Operation of a Pilot Controlled Environment Structure for the Production of High Value Crops

• The greenhouse structure was constructed by setting up the main frame, installed the insect screen; and filling the base with gravel and volcanic cinder.

• Most of the greenhouse structure components were constructed and fabricated.

Design, Construction and Operation of a Pilot Controlled Environment Structure for the Production of High Value Crops

Exhaust fans for humidity control

Greenhouse structure with fertigation tank.

Provision for misting or cooling system

A simple solar radiation control using shade net
Design, Construction and Operation of a Pilot Controlled Environment Structure for the Production of High Value Crops

Trial planting of crops in the greenhouse.

Seeds in seedling trays for transplanting

Some of the planting pots ready for seedlings.

Portion of the installed drip irrigation system.

Design and Development of a Mini-Hand Tractor and Attachments

• One prototype was developed and fabricated
• Attachments for the prototype were developed and fabricated (cage wheels, plow, and a harrow).

• Testing in field conditions was conducted.

• A cultivator attachment was modified and adapted to the mini-hand tractor.

• Completed working drawings of the mini-hand tractor
• A paper and article were prepared for publication.
Design and Development of a Mini-Hand Tractor and Attachments . . . Cont’d

The AMDP Mini-Hand Tractor

Farm Power Mechanization Sub-program
Technology Package/s for Village-Level Ethanol Production, Micro-Hydro and Wind Power

- Fabrication of several units of small-scale ethanol production system was completed.

- Initial investigative research on the use of arrowroot, sakwa and corn as raw materials for ethanol production was started.
- One prototype was brought to the pilot area for suitability testing.
- The machine was demonstrated in a techno-demo activity.

Technology Package/s for Village-Level Ethanol Production, Micro-Hydro and Wind Power .. . Cont’d

Techno-demo of the UPLB village level ethanol production plant
Advanced Electrolysis Energy System for Stationary Power

- Completed the basic designs of component parts of the project.
- Completed the design and fabrication of the electrolyser.

Overview of the Electrolyser
TRAINING, EXTENSION
AND INFORMATION GROUP

Information and Communication Technology (ICT) in Mechanization
Sub-program
Enhancement of Agricultural Mechanization through Information and Communication Technology (ICT)

- 2 GIS maps
- 1 database on available agricultural
- 1 website of AMDP

Corn Plant Disease Recognition Using Machine Vision

- Schemes to implement corn plant recognition using current communications technology were identified
- Software development using Visual Basic programming language was finished.
- The software has the capability to display gray images, extract the profile or area of the object of interest, and the perimeter of the object.

A graphical user interface of the program used to extract some image features.

Training and Extension Sub-program
Training and Training Manual Development

- Three trainor’s training on mechanization technologies for corn covering five regions of the country were conducted.
- The trainings were participated by municipal, regional, and provincial GMA-Corn Coordinators.

Region IV-A trainor’s training on corn mechanization technologies
September, 2003

Region VI, VII and VIII trainor’s training on corn mechanization technologies
October, 2003

Region V trainor’s training on corn mechanization technologies
November, 2003